INVENTION DISCLOSURE FORM

Note: This *Invention Disclosure Form* is an important legal document. Care should be taken in its preparation. The information contained in this document should not be disclosed to others outside V-Enable, Inc. ("V-Enable") without the prior written approval of the management of V-Enable.

1.   Title of the invention (10 words or less).

MiniWeb Server

2.   A.   Provide a description of the invention (including as much detail as is presently available), and use an attachment if necessary.

SHORT DESCRIPTION

This invention is a method of converting and accessing, content of different types to content types that are understood by voice only devices.

ACRONYMS AND ABBRIVIATIONS

I.P: Internet protocol
PSTN: Public Switched Telephone Network.
IVR: interactive voice response.
TTS: Text to speech.
WML : Wireless markup language
VoiceXML: extensible markup language for Voice.
VXML: Also used for VoiceXML

KEYWORDS

Speech Recognition: Ability to understand spoken works
Voice Browser: like a web browser, used for browsing content using voice.
Voice Engine: Technology that brings different types of content, technologies and interfaces together for the voice platform.

DESCRIPTION OF THE INVENTION

PROBLEM

Different types of data formats are used and made specifically for particular types of devices. WAP standard used WML as a method to display wireless content. The technology specifies use of "Cards" instead of "pages" as on the web. A new standard VoiceXML specifies how content should be played and listened to over only voice capable devices. Some less commonly used standards for web are HDML and new Japanese standard cHTML.

With so many emerging standards, it has become almost impossible for businesses to provide their web content in all possible formats.

SOLUTION

MiniWeb server solves this problem by
- Understanding the device type and content type.
- Converting data from one type to the type understood by the device.
- Playing the data in the format understood by the device.
- Maintaining constant communication.

Doing this, all existing content, in whatever format it is, can be played to the user in the requested format, without ANY change to the content or creation of new content. For e.g. existing WAP sites can be heard on the phone without the need to a WAP browser on the phone.

MINIWEB [Multi Data types to Voice]

WEB
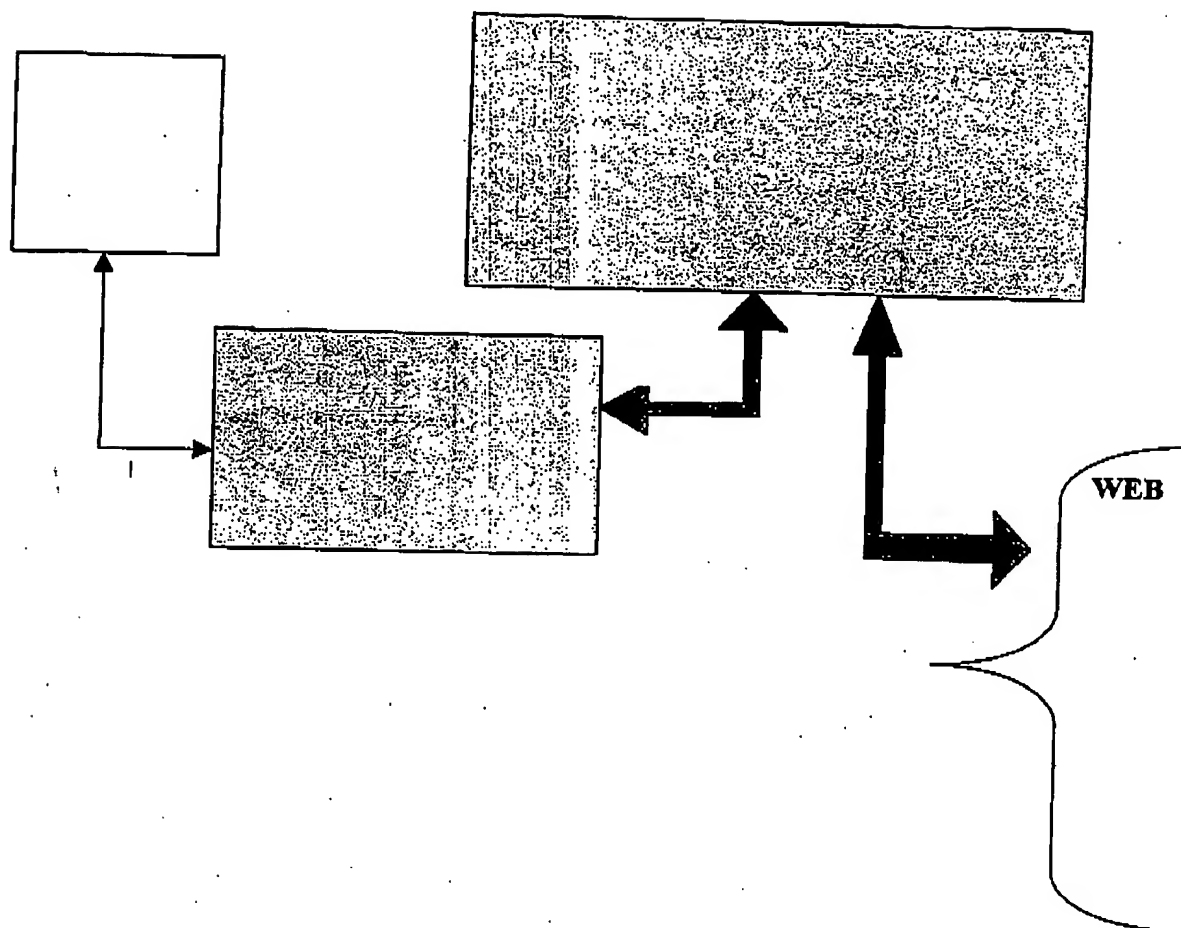
An example of this communication

> *C: used for computer (i.e. the MINIWEB server and other components involved)*
> *U: User*

U: Places a call
C: Hello, welcome to MINIWEB. Please say a WAP site name
U: wap dot CNET dot com
C: Connecting, please wait...
{ processing WAP site and converting to voice}
C: Welcome to CNET, please say a category like news, business etc.
{WAP site processed and played to user}

ACTUAL WORKING:

Steps

1. Phone call
   1.1. User dials a number, which is connected to a VoiceXML complaint voice browser.

2. VoiceXML browser
   2.1. Voice browser plays initial VoiceXML file to user
   2.2. User asks for a data file, which is not recognized by the voice browser.

The method of asking for a WAP file from the voice browser is as follows:

For ANY LINK OR CHOICE ITEM

e.g. for Choice
<choice next = http://Miniserver IP address/miniweb.jsp>

OR
<goto next= http://Server IP: port/miniweb.jsp?destination address />

E.g. for Link
<link next="http://miniserver IP address/miniweb.jsp>

where: any programmable link can be called on the server from the VoiceXML page.
Some of the possible methods are:
   Filename.jsp
   Filename.asp
   Filename.cgi etc.

And the way data is submitted to MINISERVER

<submit next="http://miniserver IP address/miniweb.jsp" method="post" namelist="site protocol" />

Explanation
   <submit>: tag in VoiceXML used for posting information (same as HTTP GET)
   next : server address for MINISERVER or any VoiceXML data conversion server.
   Method: GET or POST (same as HTTP)
   Namelist: list of variables send to the server. In our case, a site location for any and a protocol is send.
                  The protocol can be any device display protocol such as WAP, HDML, iMode, cHTML, XML, pocket web etc.

3. And 4. MiniWeb Server and Web Server.

3.1. Miniweb server gets the request from Voice Browser.

3.2. This request is received with a script at the Miniweb server. Script may be a cgi, asp, jsp or similar scripts.

3.3. A new thread is spawned for this task at the server.

3.4. Doing so, a channel is established between the user, the voice browser and the miniweb server.

3.5. Miniweb server establishes a connection to the requested server

e.g. if the user made a WAP request, Miniserver after creating a separate process for the user, will connect to the corresponding WAP server: i.e. connect to wap.cnet.com. Miniserver will do this using HTTP protocol. Alternate protocol may be used as required.

3.6. MiniWeb Server ▮▮▮▮ data required from the requested server and PRE-PROCESSES the data.

3.7. PRE-PROCESSING: Pre-Processing is a method used by the MiniWeb server to get the required information, process the requested information AND information that may be needed in future by the user. The pre-processor user NESTED-CACHING AND BRANCH TRAVERSING FOR THE SAME.

E.G VoiceXML to WML conversion [Check Appendix A]

1. Make a connection to requested WAP site
2. Get WML page.
3. Parse page using DTD (document type definition) from a standard body like wapforum.org
4. Store the parsed file in a database.
5. Apply RULES of WML mapping to VoiceXML mapping.
6. Create new VoiceXML file based on these rules.

Note -- Rules are stored in a separate file.

Same algorithm is used for conversion of different types of languages.

NESTED-CACHING AND BRANCH TRAVERSING METHOD

A content page (like WML) is characterized by content and links to further content. The structure of a typical web based data page is like a tree. With one root and lot of branches, with each branch having sub-branches.

The diagram below shows the same:

LEVEL 0

LEVEL 1
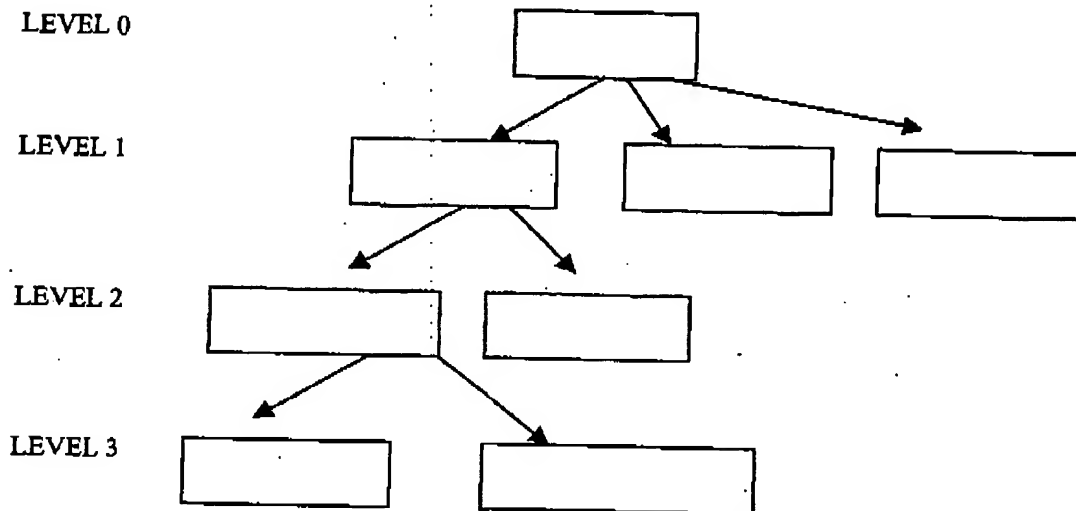
LEVEL 2

LEVEL 3

TWO LEVEL CACHING

In this method the MiniWeb server will read and convert content from WML (or other) format to VoiceXML format for two branch levels. (Starting level 0).

Conversion process:

1. Get main/root data file
2. Process file with following the rule: Every encounter to a branch will start a separate process of nested traversal. Follow rule for total of at least 2 levels or the last level whichever comes first.
3. Keep all results from the nested processes in cache.
4. Content is destroyed when the main process dies. (That is: the main file is not accessed anymore, user goes to another root document)

MiniWeb server may choose to do more than or less than two Level caching.

Nested Caching provides a superior end-user experience, as the content is already available for the user. Levels of nesting are dependent on optimization that may be done according to deployment of the MiniWeb system.

3.8 After pre processing, converted content is returned to the calling VoiceXML browser to be played to the user. User interaction is maintained in the same fashion.

B.   Summarize the critical aspects and broad applications of your work. Focus on novel features and advantages over previously known work.

PRIOR ART SOLUTIONS

WAP Browsers for the wireless phones: WAP browsers work by making a HTTP connection to the corresponding WAP site and downloading WML cards. These cards and then displayed on the Mobile screen. Each selection of a link gets another card, which is similar to links in HTML browsers.

FEATURES AND APPLICATION OF MINIWEB SERVER

HTML was the first web standard that brought content in one form to the users. Over time, web is accessed at different situations and by using different devices. Because of different device specifications, new standards were born to better fit the need to present content.

As of today some of the standards used most commonly are:

For big screen: HTML/DHTML/etc.
For wireless phones (low bandwidth): WAP/HDML
For wireless phones (med. Bandwidth) : cHTML/iMODE
For wireless PDA: Web clipping
For voice only devices (phones): VoiceXML.

Essentially devices are accepting data in two forms.
a) Voice
b) Data

MiniWeb server brings the different types of content into voice THUS ELIMINATING THE NEED OF CREATING ANOTHER NEW CONTENT TYPE FOR VOICE ONLY DEVICES.

For example: New york times can be read at nytimes.com which is a HTML based web site. Nytimes.com can also be read using WAP by accessing WAP site wap.nytymes.com. Nytimes.com CAN NOT BE accessed over voice, since the voice site is not created.
Using MiniWeb server, nytimes will be able to present content for voice without having to create it.

ADVANTAGES OF MINIWEB SERVER

➢ Creates voice type content from existing content.

- ➤ Connections to MiniWeb server may be made using HTTP protocol, thus allowing the MiniWeb server to be placed in any location and making possible remote maintenance.
- ➤ The interface between other components of the system (whole interaction process) with MiniWeb server can be done from WITHIN VoiceXML, thus eliminating the need of knowledge of any programming language and efforts for the same.
- ➤ Accessing MiniWeb server from VoiceXML using standard HTTP POST/GET methods.
- ➤ MiniWeb server's nested traversing gets the content ready even before it is required, thus eliminating the delay in process of language conversion.

3. List all inventors contributing to the invention described above. Please identify any listed inventor not employed full-time by V-Enable, and specify such inventor's other employers or employment status (e.g., self-employed consultant)

Dipanshu Sharma, President/CEO

4. Provide the date(s) of your first conception of the invention. Include any memoranda, notebooks or dated machine printouts that verify your statements, as well as the names of non-inventors who can provide independent corroboration of the conception.

Jan 18th 2001. [Comment]

5. Please identify the products of V-Enable, if any, to which the invention is relevant.

6. How (if at all) and when did you first test this invention?

Jan 22nd

7.

8. Has anyone submitted, or is anyone (whether or not employed by V-Enable) known to be planning to submit, a report, abstract, paper or thesis relating to this invention for publication or for presentation at a conference? If yes, give relevant details, including the actual or planned date of submission.

No.

9. It is important to identify any references, patents, patent applications, or other publications of which you are aware and which you believe to be pertinent to this invention. Please attach a copy of each of these references, if available.

--

11. Signatures, Names and Addresses of Inventors

a)

_____
Signature

_____
Date

_____
Print Name

_____
City/State/Zip

_____
Telephone

b)

_____   _____
Signature   Date

_____
Print Name

_____
City/State/Zip

_____
Telephone

Note: If there are more inventors, please provide signatures, names and addresses on an additional sheet of paper.

Submit this form with ORIGINAL SIGNATURES directly to MANAGEMENT OF V-ENABLE AS SOON AS IT IS COMPLETED.

12.   Technically Qualified Witnesses (Two Required) — invention disclosed to and understood by:

a)

_____   _____
Signature   Date

_____
Print Name

b)

_____   _____
Signature   Date

_____
Print Name

NOTE: DISTRIBUTION OF COPIES OF A COMPLETED FORM TO THIRD PARTIES IS EXPRESSLY
             PROHIBITED, WITHOUT WRITTEN PERMISSION OF THE MANAGEMENT OF V-ENABLE
             AND A CONFIDENTIALITY AGREEMENT.

APPENDIX A: Example WML to VXML

Actual WML for wap.cnet.com

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<!-- Deck Source: "http://wap.cnet.com" -->
<!-- DISCLAIMER: This source was generated from parsed binary WML content. -->
<!-- This representation of the deck contents does not necessarily preserve -->
<!-- original whitespace or accurately decode any CDATA Section contents, -->
<!-- but otherwise is an accurate representation of the original deck contents -->
<!-- as determined from its WBXML encoding.  If a precise representation is required, -->
<!-- then use the "Element Tree" or, if available, the "Original Source" view. -->

<wml>
 <head>
  <meta http-equiv="Cache-Control" content="must-revalidate"/>
  <meta http-equiv="Expires" content="Tue, 01 Jan 1980 1:00:00 GMT"/>
  <meta http-equiv="Cache-Control" content="max-age=0"/>
 </head>

 <card title="Top Tech News">
  <p align="left">
  CNET News.com
  </p>
  <p mode="nowrap">
   <select name="categoryId" ivalue="1">
    <option onpick="/wap/news/briefs/0,10870,0-1002-903-1-0,00.wml">Latest News
Briefs</option>
    <option onpick="/wap/news/0,10716,0-1002-901,00.wml">Latest News Headlines</option>
    <option onpick="/wap/news/0,10716,0-1007-901,00.wml">E-Business</option>
    <option onpick="/wap/news/0,10716,0-1004-901,00.wml">Communications</option>
    <option onpick="/wap/news/0,10716,0-1005-901,00.wml">Entertainment and Media</option>
    <option onpick="/wap/news/0,10716,0-1006-901,00.wml">Personal Technology</option>
    <option onpick="/wap/news/0,10716,0-1003-901,00.wml">Enterprise Computing</option>
   </select>
  </p>
 </card>

</wml>
```

Converted to VXML

```
<?xml version="1.0"?>
<vxml version="1.0">
<head> <meta/> <meta/> <meta/>
</head>
<form>
<block>
<prompt>CNET News.com</prompt>
</block>
<block>
<grammar>
[ ( latest news briefs ) ( latest news headlines ) ( e-business ) ( communic
ations ) ( entertainment and media ) ( personal technology ) ( enterprise com
puting ) ]
</grammar>
<goto next="#categoryId" />
</block>
</form>
<menu id="categoryId" >
<property name="inputmodes" value="dtmf" />
<prompt>Please Say <enumerate/>
</prompt>
<choice dtmf="0"   next="http://server:port/Convert.jsp?url=
http://wap.cnet.com/wap/news/briefs/0,10870,0-1002-903-1-0,00.wml"> Latest News Briefs </choice>
<choice dtmf="1"   next="http:// server:port /Convert.jsp?url=http://wap.cnet.com/wap/news/0,10716,0-
1002-901,00.wml"> Latest News Headlines </choice>
<choice dtmf="2"   next="http:// server:port /Convert.jsp?url=http://wap.cnet.com/wap/news/0,10716,0-
1007-901,00.wml"> E-Business </choice>
<choice dtmf="3"   next="http:// server:port /Convert.jsp?url=http://wap.cnet.com/wap/news/0,10716,0-
1004-901,00.wml"> Communications </choice>
<choice dtmf="4"   next="http:// server:port/Convert.jsp?url= http://wap.cnet.com/wap/news/0,10716,0-
1005-901,00.wml"> Entertainment and Media </choice>
<choice dtmf="5"   next="http:// server:port /Convert.jsp?url= http://wap.cnet.com/wap/news/0,10716,0-
1006-901,00.wml"> Personal Technology </choice>
<choice dtmf="6"   next="http:// server:port /Convert.jsp?url= http://wap.cnet.com/wap/news/0,10716,0-
1003-901,00.wml"> Enterprise Computing </choice>
<default>
<reprompt/>
</default>
</menu>
</vxml>


<! END OF CONVERSION >
```